ALASKA ECONOMIC TRENDS

Prospects for Aquaculture Diversification in Alaska

Employment in Alaska's Seafood Industry

Alaska's Employment Scene

Working in the Fishing Industry

Alaska's Largest Employers

Alaska Economic Trends

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We welcome contributions on current economic issues from our readers. For a copy of our editorial policy contact Dr. Edward W. Eboch, Editor, Alaska Economic Trends, Alaska Department of Labor, P.O. Box 25501, Juneau, Alaska 99802-5501.

Alaska's Largest Employers

By Neal Fried, Greg Huff and Judy Hallanger

For the first time the Alaska Department of Labor has produced a current list of Alaska's top 50 private employers (Table 1) based on the number of workers each company employs in Alaska./1 Several of Alaska's top 50 employers are members of the Fortune 500. The others, if not of national or international stature, are regionally recognized and are major players in Alaska's economy.

While most of the companies listed are familiar, there may be a few companies which may not be easily recognized. For example, fifth ranked Lutheran Hospital & Homes of America may not be familiar because they are better known by their individual operations, such as Fairbanks Memorial Hospital. This, and other events, such as a company changing its names since 1985, are footnoted at the end of Table 1. These footnotes provide the best information available.

Two rankings are provided; one based on the company's average annual employment in 1985 (the last calender year for which data is available) and their July 1985 through June 1986 employment. In some cases the rankings have changed.

Also provided is the major industry category and the location of each company. Two locations for each company are presented in Table 1. The first location covers the area where that company operates in Alaska, but if it operates in more than one community, as is the case with most of the firms, then a statewide designation is given. The second location gives the company's Alaska headquarters or the location of the largest operation.

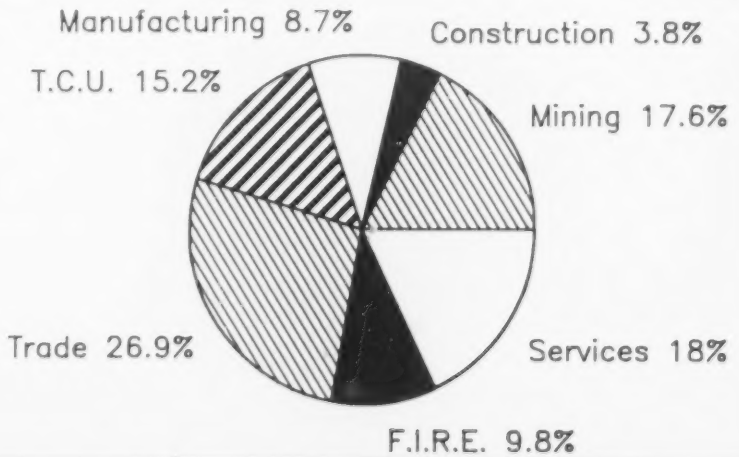
Alaska's top 50 represent 20% of all private jobs in Alaska.

Firm Size

Alaska's top 50 represent only a small percentage of private business firms operating in Alaska (less than ½ of 1%), but their employment represents nearly 20% of all private jobs in Alaska and an even greater portion of wages and salaries. While the top 50 only represent a small number of firms they are a major force in the Alaskan economy.

In 1985, Alaska's 50 largest private employers ranged in size, as measured by employment, from 308 to 2,835 employees. They were involved in a variety of activities: from oil and gas production to private social services. In total they employed an annual average 31,217 people in 1985.

Figure 1
Top 50 Firms in Alaska
Employment by Industry



1/ The employment data is based on records of unemployment insurance contributions reports. The data is based on U.I account numbers, so the employment figures may not include the total employment of a parent company if the subsidiaries are under another account number. The employment information is protected by confidentiality laws and therefore it was necessary to receive written permission from each company to release the information before it could be published. All of the companies were very cooperative in this effort.

19% of total private sector employment and 13.5% of total employment.

Alaska's top 50 paid $1.06 billion in wages in 1985, 24% of all wages paid by private employers in the state. The top 50 firms tend to pay higher average wages and salaries than for all firms in Alaska. The average monthly pay in 1985 for employees working for Alaska's top 50 employers was $2,793 compared to the average private sector monthly pay of $2,369.

Because the top 50 employers are larger than the average company they tend to be able to weather economic downturns better. From the second quarter of 1985 to the second quarter of 1986 employment among the top 50 declined 2.5% compared to a 5.2% decline among the total private sector.

When examining the ranking of the top 50 Alaska firms in Table 1, the annual average data obscures the seasonal fluctuations in employment for some industries. If the ranking was based on a single month or quarter the seasonal fluctuations would result in shifts in the ranking during the course of a year. The primary examples are the seafood processing and construction industries. During the summer, seafood processing employment levels peak and the ranking of the processors climbs but their ranking falls just as quickly when the peak season ends. The construction industry generally follows a similar pattern of extreme fluctuations in employment levels.

Industry Breakout

Not only do the top 50 represent a considerable portion of jobs in Alaska they represent a significant share of employment in their specific industries. Of the 31,200 jobs among the top 50 employers in 1985, the trade industry had the greatest number of jobs and construction the fewest. Trade also had the most firms in the top 50. These fifteen firms represented nearly a quarter of the top 50's employment in 1985, while the three construction firms within the top 50 made-up less than 4% of the 31,200 jobs (Figure 1).

The four oil and gas firms in the top 50 in 1985 represented nearly 60% of total mining employment in Alaska. ARCO and SOHIO, the two largest oil companies, accounted for 44% of total statewide mining employment. The construction industry, on the other hand, was composed more than any other industry of small firms. Only 6% of total construction employment is within the top 50 employers list.

Although the members of the top 50 within the trade industry represented 18% of total trade employment, some members comprised a greater share of their specific retail business. For example, the largest two firms in the trade industry are Alaska's largest grocers, Carr's and Safeway, which represent 45% of total employment in Alaska's food store industry. The four merchants within the department store sector (Fred Meyer, Sears, J C Penney and Nordstroms) had employment levels in 1985 that accounted for nearly 85% of statewide employment levels within their industry.

The largest of the services firms; Providence Hospital, Lutheran Hospital and Homes of America, and Humana Hospital, accounted for over three quarters of private hospital and nursing and personal care employment in Alaska.

Several firms dominate their industries. Alyeska Pipeline Company represents 90% of oil pipeline employment in Alaska, while Alascom, the big player in the telephone communication industry, represents nearly 60% of that industry's total employment. (This does not include local government owned and operated systems.) Four of the eight firms in the transportation, communication, and utilities industry are air transportation firms which accounted for 34% of all air transportation employment in Alaska. The four banks among the top 50 represent 64% of banking employment statewide, while the single credit union represented 1/3 of total credit union employment statewide.

Location of the Top 50

The top 50 firms can be found throughout Alaska, from Ketchikan to the North Slope, from Cordova to Adak. In 1985 the top 50 had employees in at least 57 communities across Alaska, although they tend to be concentrated in Anchorage. As an industry group the financial institutions are most widely distributed among the top 50. On average, they had employees in 13 communities with one firm located in 22 communities.

In the trade industry, Sears and Spenard Builders Supply had operations in more communities than any other retail establishment. Carr's and Safeway were distributed in the six largest communities in the Southcentral part of the state, but along with Spenard Builders they have several locations in Anchorage.

Because of the scope of their services Alascom, MarkAir, and Alaska Airlines are well represented across the state, each having employees in at least 15 communities. The Salvation Army was in 13 communities. The only hotel operator in Alaska among the top 50 with locations in more than one community was Sheffield Enterprises.

Unique among the top 50 are the oil companies with operations on the North Slope and in Cook Inlet, but as is common with most top 50 firms they have an Anchorage headquarters. The construction firms are much the same as the oil firms. They are headquartered in Anchorage, but their main operations are related to oil field construction on the North Slope.

The manufacturing firms that are connected to fish processing and lumber and paper manufacturing, among the top 50, are the firms most likely to be based outside Anchorage and still have multiple locations. On the other hand, Alaska's two largest newspapers are Anchorage based, but distributed statewide.

Conclusion

Alaska's 50 largest employers accounted for over 31,000 jobs (20% of total private employment) and $1.06 billion in wages (24% of private wages) in Alaska. They represent a variety of industries and tend to have Anchorage headquarters with operations around the state. These firms were major contributors to economic growth and expansion in the past and will continue to play a leadership role in Alaska's future.

Table 1
Alaska's Top 50 Firms
(based on 1985 average employment)

Firm Name	1985 Rank	June 86 Rank	1985 Employment	Industry	Area	Headquarters or Largest Site
ARCO Alaska, Inc. 1/	1	1	2,835	Mining	Statewide	Anchorage
Carrs Quality Centers, Inc.	2	2	1,894	Retail Trade	Statewide	Anchorage
Providence Hospital	3	3	1,627	Services	Anchorage	Anchorage
SOHIO Alaska Petroleum Co. 2/	4	4	1,348	Mining	Statewide	Anchorage
Lutheran Hospital & Homes of America 3/	5	5	1,066	Services	Statewide	Fairbanks
Alascom, Inc.	6	6	1,028	Trans. Communication & Utilities	Statewide	Anchorage
National Bank of Alaska	7	7	942	Finance, Insurance & Real Estate	Statewide	Anchorage
Alyeska Pipeline Service Co., Inc.	8	10	907	Trans. Communication & Utilities	Statewide	Anchorage
Safeway Stores, Inc.	9	8	845	Retail Trade	Statewide	Anchorage
1st National Bank of Anchorage	10	11	803	Finance, Insurance & Real Estate	Statewide	Anchorage
VECO, Inc.	11	9	771	Mining	Statewide	Anchorage
Alaska Airlines, Inc.	12	12	768	Trans. Communication & Utilities	Statewide	Anchorage
McDonalds 4/	13	13	679	Retail Trade	Statewide	Anchorage
Humana Hospital Alaska, Inc.	14	14	665	Services	Anchorage	Anchorage
Alaska USA Federal Credit Union	15	15	631	Finance, Insurance & Real Estate	Statewide	Anchorage
Icicle Seafoods, Inc.	16	17	630	Manufacturing	Statewide	Petersburg
MarkAir	17	16	619	Trans. Communication & Utilities	Statewide	Anchorage
Union Oil Co. of California	18	20	547	Mining	Statewide	Anchorage
Fred Meyer Shopping Centers	19	19	524	Retail Trade	Statewide	Anchorage
Spenard Builders Supply, Inc.	20	22	511	Retail Trade	Statewide	Anchorage
Sears Roebuck and Co.	21	21	509	Retail Trade	Statewide	Anchorage
Ketchikan Pulp Co.	22	18	494	Manufacturing	Statewide	Ketchikan
Captain Cook Hotel	23	24	459	Services	Anchorage	Anchorage
J C Penney Co.	24	26	454	Retail Trade	Statewide	Anchorage
Nordstrom, Inc.	25	23	449	Retail Trade	Statewide	Anchorage
Anchorage Daily News, Inc.	26	25	439	Manufacturing	Anchorage	Anchorage
Pioneer Construction Co.	27	36	437	Construction	Statewide	Anchorage
Anchorage Times Publishing Co., Inc.	28	31	426	Manufacturing	Anchorage	Anchorage
Felec Services, Inc.	29	28	408	Trans. Communication & Utilities	Statewide	Fairbanks
Alaska Commercial Co.	30	29	408	Retail Trade	Statewide	Anchorage
Wilsyk, Inc.	31	32	402	Services	Statewide	Anchorage
Sheffield Enterprises, Inc.	32	30	401	Services	Statewide	Anchorage
Pay N Save 5/	33	41	398	Retail Trade	Statewide	Anchorage
All Alaskan Seafoods, Inc.	34	27	398	Manufacturing	Statewide	Kodiak
AIC-Martin JV, Inc.	35	100	385	Construction	Statewide	Anchorage
Yukon Office Supply, Inc. 6/	36	34	379	Wholesale Trade	Statewide	Anchorage
Chugach Electric Association, Inc.	37	33	375	Trans. Communication & Utilities	Statewide	Anchorage
Alaska National Bank of the North	38	37	369	Finance, Insurance & Real Estate	Statewide	Anchorage
H C Price Construction Co.	39	81	365	Construction	Statewide	Anchorage
Lamonts, Inc.	40	35	352	Retail Trade	Statewide	Anchorage
Tanana Chiefs Conference, Inc.	41	40	349	Services	Statewide	Fairbanks
Int'l. In-Flight Catering Co., Ltd.	42	39	348	Retail Trade	Anchorage	Anchorage
Alaska Sales & Service, Inc.	43	49	338	Retail Trade	Anchorage	Anchorage
Sheraton Anchorage Hotel	44	44	335	Services	Anchorage	Anchorage
ERA Helicopters, Inc.	45	43	331	Trans. Communication & Utilities	Statewide	Anchorage
Alaska Pulp Corporation	46	46	326	Manufacturing	Sitka	Sitka
Reeve Aleutian Airways, Inc.	47	51	313	Trans. Communication & Utilities	Statewide	Anchorage
Burger King 7/	48	42	312	Retail Trade	Statewide	Anchorage
Salvation Army, Alaska Division	49	48	310	Services	Statewide	Anchorage
First Interstate Bank of Alaska	50	54	308	Finance, Insurance & Real Estate	Statewide	Anchorage

1/ Includes Atlantic Richfield Co. employees.
2/ Currently named Standard Alaska Production Co.
3/ Includes Fairbanks Memorial Hospital and facilities in Kodiak, Soldotna, and Valdez.
4/This is Alaska's largest McDonalds franchise. It includes only Anchorage, Palmer, and Wasilla McDonalds.
5/ Seattle Standard Corp. is the parent corporation.
6/ Currently named The Office Place.
7/ This franchise includes Anchorage, Fairbanks, and Wasilla Burger Kings.

We would like to thank the employers for the cooperation and time in responding to our survey. The survey enabled us to provide this information and hope in the years to come that we may continue providing information of Alaska's Top 50.

Prospects for Aquaculture Diversification in Alaska

By Brad Pierce 1/

Aquaculture is a general term which can be defined as the cultivation of finfish, shellfish and aquatic plants in fresh or saltwater. Mariculture is a more specific term which refers to the cultivation of plants and animals in saltwater. Aquaculture in Alaska is presently centered around a highly successful salmon hatchery program where juveniles are reared in a protected freshwater environment and released to migrate to sea and return as adults. During the past few years, attention has turned to the possibilities offered by adapting techniques used in other parts of the world to utilize Alaska's clean, nutrient-rich marine waters and vast areas of suitable habitat for mariculture development. Two species—Pacific oysters and blue mussels—are currently being farmed in commercial quantity and salmon, giant kelp and scallops are being studied for their feasibility in Alaska.

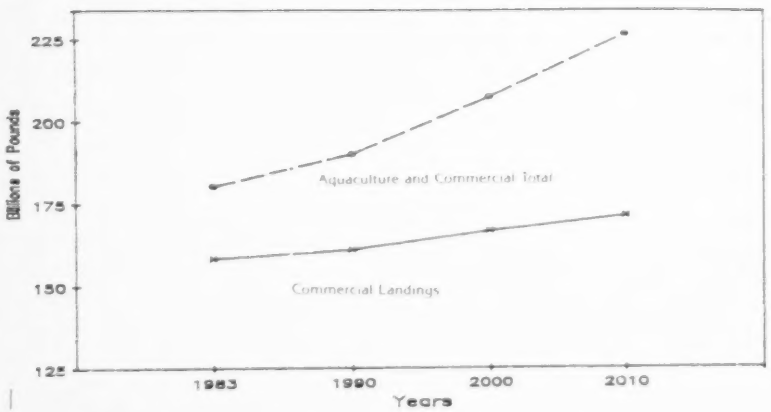
The Big Picture

Annual world per capita consumption of fish and shellfish is presently 28.6 lbs.

World commercial landings of fish and shellfish have remained rather static at 70-75 million metric tons (mt) during the past 15 years. This suggests that naturally occurring stocks are being harvested at or near their upper level of capacity. An annual average increase in commercial landings of just 0.3 percent is forecast by the National Marine Fisheries Service (NMFS) through 2010. World commercial fisheries landings accounted for about 88 percent of total world production of fish and shellfish, while aquaculture production accounted for the remaining 12 percent by 1983. As portrayed in Figure 1, the NMFS expects the commercial fisheries component to slip to 76 percent of current levels and aquaculture production to increase at a 5.5 percent annual rate by 2010.

Annual world per capita consumption of fish and shellfish is presently 28.6 lbs., which is expected to increase to 34 lbs. by the turn of the century. Over the same period, population is forecast to increase from 5.0 billion to 6.1 billion. These global factors combine to portend a 15 million mt annual market for aquaculture products by the turn of the century. Many experts argue that we are in the beginning stages of a worldwide "blue revolution" in aquaculture development similar to the "green revolution" in agriculture of the 1960s, which had profound social and economic consequences worldwide and transformed many food-importing countries of the third world into net food exporters.

Figure 1
World Production of Fish and Shellfish



Source: "Future of Aquaculture: Profile of a Growth Industry," International Aquaculture Foundation, February 1985, pg. 8.

The United States as a major market for fish and shellfish and Alaska as a major producer of seafood can be expected to experience substantial economic impacts as the worldwide protein production potential of aquaculture is realized. Domestic seafood markets are among the fastest growing in the world and have been dramatically affected by aquaculture production. United States per capita consumption of fish and shellfish has increased 13 percent since 1980, while total domestic annual consumption of seafood increased by 19 percent. This trend is expected to continue as American consumers be-

1/ Brad Pierce is a Legislative Analyst with the Alaska House of Representatives Research Agency in Juneau, Alaska.

come more knowledgeable about the health benefits of eating seafood and increasingly sophisticated about different species and methods of preparation. Most of the increase in domestic demand for seafood is being met by imports. Fresh salmon imports increased from 1.1 million pounds in 1982 to 13.8 million pounds in 1984. In fact, imports of foreign fish and shellfish grew by 14 percent in 1985 alone and the U.S. fisheries trade deficit amounted to $5.6 billion that year.

Alaska's Place in the Blue Revolution

Alaska's competitive position as a producer of aquaculture products will depend on the economics of production and distribution as well as worldwide conditions of supply and demand for seafood. The state's physical potential for aquaculture development is quite large. Major physical advantages include enormous natural salmon runs (which are being supplemented by public and private hatchery production), clean nutrient-rich waters and many undeveloped areas that are suitable for mariculture sites. For species other than salmon, however, cold water temperatures limit the number of varieties that can be cultivated economically.

Aquaculture development in Alaska has the economic advantages of a well developed fisheries infrastructure and barrier-free access at reasonable cost to rapidly growing domestic seafood markets. The classic economic development triad of cooperation between government, the university system and private industry already exists in Alaska and has been proven in the salmon hatchery systems. The major disadvantage of further aquaculture diversification in Alaska is generally high operating costs. Since the State and federal government own most of the coastal lands in Alaska and the State has jurisdiction over waters to three miles offshore, government policies (particularly as they affect operating costs) will play a substantial role in future development.

Major obstacles to diversification of the aquaculture industry are legal and political. Aquatic farming legislation (HB 108, SB 106) would have established an administrative and regulatory framework allowing further aquaculture development. Several significant issues need to be resolved including potential user conflicts over mariculture sites; the dangers of disease transmission or genetic degradation of wild stocks; environmental hazards of fish waste accumulation or effects of antibiotics in feed being diluted into the water; and impacts to the existing fishing industry, especially on fish prices and access to State loan programs.

While salmon farming is the most controversial form of development, other aquaculture activities such as the rearing of mussels, oysters, scallops and sea vegetables are not perceived as a direct threat to the traditional fishing industry. All of the other aquaculture products mentioned above which could be developed in the near term (next five years) are likely to be of minor economic importance, however, when compared to the potential of salmon farming.

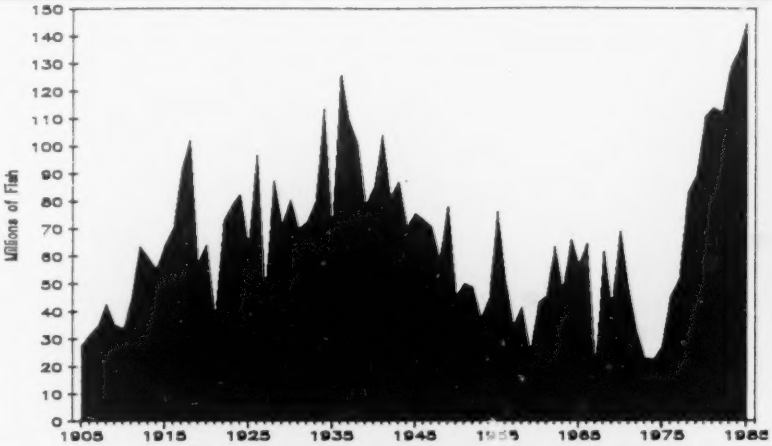
Salmon Farming

The new form of aquaculture development with the most economic potential is salmon farming. The pen rearing (farming) of salmon, where smolts are held captive in pens and fed until they reach harvester size is a relatively new industry that has largely developed since 1970. Norway is the leading producer of farmed salmon, but twelve other countries are rapidly developing their own salmon farming industries.

In 1986 approximately 59,200 metric tons (mt) of farmed salmon were produced worldwide, compared to a 657,000 mt wild harvest. By 1990, production of farmed salmon is forecast to increase to 107,000 mt while the wild harvest is expected to stabilize at about 677,000 mt. By comparison, the 1986 Alaska salmon harvest was 268,000 mt. The proportion of farmed to wild salmon in world markets is expected to increase from 8.3 percent (1986) to 13.7 percent by 1990. Figure 2 gives a historical perspective on Alaska's wild salmon production and Figure 3 provides a graphic representation of proportionate world salmon production (farmed and wild) by major producing countries.

Since about 43 percent of world salmon production and 90 percent of U.S. salmon come from the commercial harvest in Alaska, the enormous influx of farmed salmon into world markets (particularly domestic markets for premium species) expected in the early 1990s will have major implications for the value of Alaska's market share. Farmed salmon compete most directly with premium wild species—chinook, cohos and sockeye. The combined 1986 Alaska harvest of chinook (5,070 mt) and cohos (18,771 mt) was about half the 48,600 mt Atlantic farmed salmon produc-

Figure 2
Alaska Commercial Salmon Catch 1904-1985



Source: Alaska Commercial Salmon Catches 1878-1984, Alaska Department of Fish and Game, Division of Commercial Fisheries, February 1985.

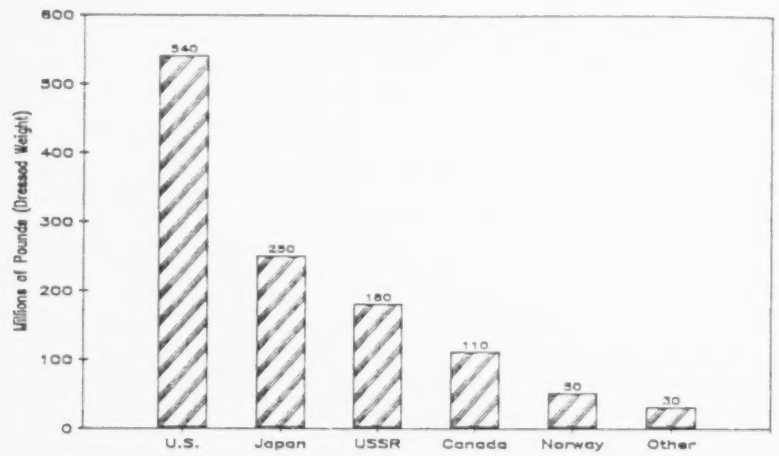
tion. The 1986 Alaska sockeye harvest was 88,575 mt. Sockeye are primarily sold on the Japanese market and thus are not expected to be a major factor in the fierce domestic market competition of the 1990s.

Recently British Columbia has become the focal point for farmed Pacific salmon development, with Chilean, Japanese and New Zealand production also expanding rapidly.

maintaining a frozen inventory of wild fish in the off season.

The next major challenge to producers of farmed salmon is to move into the mass retail market (i.e., supermarkets) and win acceptance with the great bulk of domestic consumers. This market segment is where wild fish from Alaska will likely face their greatest competition in the near future. Farmed production

Figure 3
World Salmon Production, 1984



Source: *Seafood Business Report*, Volume 4, Number 2, March/April 1985.

British Columbia is likely to be Alaska's major competitor in premium domestic markets as further pen rearing development in Puget Sound and Maine has been slowed by opposition (primarily on aesthetic grounds) from waterfront homeowners and real estate interests.

Fresh Atlantic farmed salmon have been targeted at the top of the domestic market and have enjoyed their greatest acceptance with fine restaurants and specialty fish shops, where quality and continuity of supply are prime considerations. Farmed Atlantics have also captured a large portion of the European smoker market, once dominated by wild fish from Alaska. Even though the characteristics of wild Pacific species are superior (flesh color, oil content), many smokers have switched to farmed Atlantics because they can order them fresh as needed and do not have to bear the energy and interest costs of

fits in with the ability of these stores to plan, schedule and market large fresh product volumes of consistent quality and price over long periods each year. Farmed salmon of specific quality and size can be purchased via long-term fixed price contracts. The key to mass markets will be lower prices for farmed products.

Ninety-seven percent of Alaska's production of premium salmon species is sold in frozen form. Salmon farmers only marginally compete with fisherman in Alaska in today's markets but this situation is beginning to change. As can be seen in Figure 4, the year-round volume of imports of farmed salmon is increasing rapidly as producers begin to compete more directly with domestically produced fish. By the early 1990s, large volumes of farmed fish are likely to saturate the fresh salmon market and begin to spill over to frozen markets where they will compete directly with wild fish from Alaska.

New entrants to the salmon farming industry are likely to face stiff price competition from established producers within the next five years. Those with unamortized development costs or improperly scaled operations could be very vulnerable to price undercutting by producers such as Chile, which has very low labor and feed costs, and new Alaska fish farmers may have difficulty surviving the anticipated industry shakeout. Interestingly, salmon farming operations do not appear to benefit from significant economies of scale. In Norway, the most profitable operations appear to be medium-sized (140 mt) farms which have average annual costs of about $400,000 and revenues of approximately $640,000. Larger and smaller scaled operations tend to have lower rates of return.

According to the British Columbia Salmon Farmers Association, a properly scaled operation requires a capital outlay of about $1 million in the first two years of operation before any fish are ready for harvest. About 40 percent of the capital investment (estimated at slightly over $75 million) for the 75 salmon farms currently operating in British Columbia came from foreign investors, mainly Norwegian banks. It is likely that an influx of foreign capital would occur if Alaska were to allow salmon farming, since domestic banks have no experience with aquaculture and State loan programs are generally being reduced.

Salmon farming is a capital intensive business. Labor costs amount to about 15 % of total annual operating costs. The average 108 mt farm in British Columbia employs 5.5 persons and has a payroll of $98,920. Salmon farm employees are not highly paid—the average salary in British Columbia is about $18,000 per year. In this respect, salmon farming employment is similar to the fish processing industry, however, unlike the seafood processing industry which relies heavily on nonresident and seasonal employees—fish farming provides year-round jobs to residents and could become an important source of income to coastal communities.

It is estimated that a fully developed 20,000 mt salmon farming industry in Alaska would directly employ in excess of 1,000 persons and have gross sales on the order of $130 million. A 20,000 mt salmon farming industry in Alaska is many years in the future, although a 4,000 mt industry may be possible four to five years after enabling legislation is adopted.

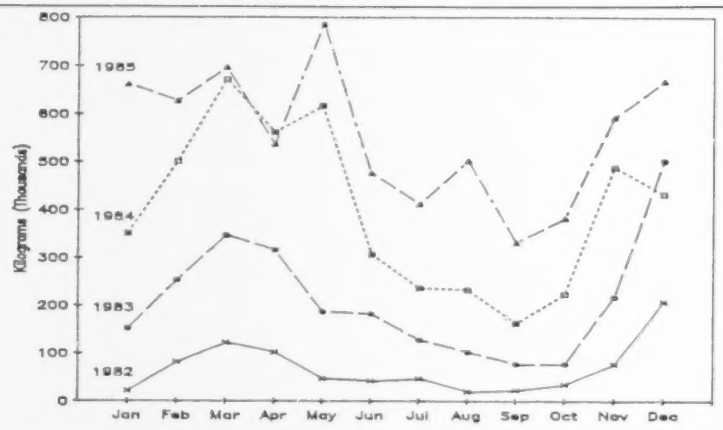
The market impacts of a 20,000 mt Alaska salmon farming industry are small compared to the impact of the expected increase in the supply of farmed salmon worldwide. Preliminary estimates indicate that increased supplies of non-Alaska farmed salmon will cause a $5 million to $36 million loss in revenue to the Alaska fishing industry by 1990. A fully developed Alaska salmon farming industry could result in an additional 10-15 percent ($500,000 to $4 million) revenue loss. In relative terms, prices for Alaska salmon are expected to fall by about nine percent as a result of world farmed salmon production and an additional one percent if Alaska were to develop a 20,000 mt industry.

The domestic seafood market is very dynamic; there appears to be considerable room for expansion of fresh salmon sales. Significant substitution effects between wild and farmed salmon have not shown up in domestic sales data which suggests that the fresh market is not close to the saturation level. There is a window of opportunity for Alaska to enter the salmon farming business that will close as existing producers establish their share of the domestic market for premium salmon products. At this point, we can only guess that real price competition between wild and farmed salmon in frozen markets will occur sometime in the early to mid-1990s.

Oysters

Oysters are the only mariculture product in Alaska that are specifically addressed in State law and regulated by the Board of Fisheries. Oysters were farmed for a brief period in Southeast Alaska prior to statehood using beach culture methods. Experimental production using raft culture techniques began in 1978, with the first commercial sales occurring in 1983. Today there are 20 permitted oyster farms in Alaska, with seven actually growing oysters and two farms with commercial sales. Half-shell oysters take two growing seasons to produce and sell for about 50 cents each or $3/lb. The Department of Fish and Game does not compile statistics on oyster production, but from conversations with producers it appears that 1986 sales amounted to 30,000-32,000 oysters.

Figure 4
U.S. Imports of Norwegian Salmon 1982-1985



Source: Ronald V. Rogness and Dr. Biing-Hwan Lin, "The Marketing Relationship Between Pacific and Pen-Raised Salmon: A Survey of U.S. Seafood Wholesalers, University of Alaska, Fairbanks.

Oysters only rarely spawn in Alaska because they require a sustained water temperature of 68 to 72 degrees for approximately one month. This biological fact has both good and bad implications for oyster farmers in Alaska. On the positive side, because oysters do not spawn, they remain fat and succulent during the summer when Puget Sound oysters get mushy and bitter. This gives Alaska producers a foothold in fresh half-shell markets during the summer months. Actually oyster farmers in Alaska have little trouble selling all they can produce. Demand for oysters is high and domestic production is declining because of water quality problems in Puget Sound and New England.

On the negative side, juveniles (spat) must be imported from outside the state. Nonindigenous spat is very hearty and has a high (90 percent plus) survival rate but is not genetically adapted to Alaska. Therefore growth rates are fairly uneven among juveniles. A selective breeding program could develop an Alaska strain within a few generations that would grow uniformly well.

A major priority for oyster farmers is to establish a hatchery in the state. At their present scale of production, it would not be feasible to generate enough from an assessment tax on gross sales to pay for a hatchery. Thus a State-funded facility appears to be the most realistic option at present.

Each shipment of oysters (or other farmed shellfish) that is sold, must be tested for paralytic shellfish poisoning (PSP) by the Department of Environmental Conservation as a condition of their shucker/shipper permit. The DEC testing lab is located in Palmer. Oyster farmers, most of whom are located in Southeast, must remove their oysters from the water and send off a sample to be tested before they can ship their product. It often takes three days to receive results back from the lab by phone. Even though the oysters can easily survive the interval out of the water, they lose some of their shelf life because of the delay. Oyster and other shellfish farmers are selling a gourmet product and freshness is of paramount importance, so the testing delay is bothersome. Thus shellfish

farmers of all types in Alaska are lobbying the legislature for regional PSP testing facilities.

It takes two years for an oyster farm to produce a harvest. During the winter, the oyster rafts only require custodial care, but during the intense April to October growing season, oyster farming is a fairly labor intensive operation. The screens in the rafts must be cleaned and the oysters must be turned and sorted regularly to assure maximum growth. It is estimated to take a capital investment of about $110,000 during the first two years of operation to raise enough oysters to have an economically viable business and earn a living wage. Oyster farms are generally sited in remote locations. Because the farmer must remain on site for most of the year, it is difficult to hold down another job.

All shellfish farmers in Alaska operate under a complicated site permitting situation. The Department of Natural Resources (DNR) administers the leasing of sites for shellfish farms. The terms of shellfish site leases were originally drafted for log transfer sites and do not give an operator enough security to obtain long-term financing. The DNR is in the process of drafting new site regulations, specifically designed for mariculture operations. The idea is to have a screening procedure for new applicants that does not allow for site speculation and a prove out period to keep sites from being tied up and not developed. Operators who establish a viable business would be allowed long-term leases.

Mussels

Blue mussels are the only indigenous shellfish species that is currently being farmed in commercial quantities in Alaska. Mussels are a rich food source and can produce more protein per acre than any other farm crop. Although considered to be a gourmet item in North America, mussels are a primary food source in many parts of the world. The domestic market for mussels is quite large and growing rapidly. Some of the U.S. market for mussels is supplied by farms in Puget Sound, the Santa Barbara Channel (mussels grown on oil rigs) and New England, while imports from Europe, Chile, New Zealand and Asian countries account for most of the rest.

Because of water quality problems, no new mussel farms are likely to be permitted in Puget Sound in the near future. Another problem faced by shellfish growers in Puget Sound is plankton blooms (red tide) in late summer which nearly shut down sales for about two months each year. In many areas of New England, harvested mussels must go through a depuration process, where they are flushed with clean saltwater for a certain time period before they can be sold. European mussel farmers are also facing severe water quality problems. These factors add up to a very promising domestic and export market situation for mussel farmers in Alaska. Freight rates from Alaska to both the U.S. and Europe are cheaper than they are for several of the exporting countries cited above.

There are currently five permitted mussel farms in Alaska—three in Kachemak Bay and one each in Prince William Sound and Kodiak. Mussel farmers benefit from the same market situation as oyster farmers. Thus far, only one farm is producing mussels in commercial quantities (10,000 lbs. in 1986).

Mussel farming is a moderately labor intensive business. The larvae can be collected at the free floating stage on lines suspended in the water or juveniles can be scraped off rocks or cliff faces and contained in sock nets around a hanging line. When the mussels become attached to the line, the containment sock is removed. The hanging lines are then suspended from rafts. Periodically the lines must be inverted and sediment and debris scraped off. Mussels take from 12-18 months to mature and can be harvested at any time of the year.

Mussels are sold live, in the shell for about $1.45/lb. wholesale and $2.99/lb. retail. Based on the economics of present operations, six rafts yielding an average of 5,000 lbs. each would generate sufficient returns for a family living at the farm site, once initial investment costs have been recovered. We do not have an adequate information base to discuss investment costs in detail but it appears that mussel farming could be an ideal family-type operation that can be practiced in many suitable coastal regions of the state. Combined with the cultivation of other species, it can allow a small operator to make a comfortable living and enjoy a remote life-style. In some other areas of the world, mussel rafts have been placed around salmon pens to feed off the fines from salmon food suspended in the water.

Scallops

The stable price of scallops over the years (about $4/lb.) and a growing domestic shellfish market makes it a very attractive species for mariculture. There are several scallop larvae collection efforts underway in the waters around Kodiak Island and other areas of Prince William Sound and Southeast. The Kodiak efforts are being coordinated under a joint Alaska-Japan development project to adapt techniques used to grow the Japanese scallop, which has been under cultivation for over twenty years in that country. Japan has a very large scallop culture industry, located mainly on Hokkaido, that produces about 200,000 mt of scallops annually. Kodiak has some of the richest scallop-growing conditions in the world and the species that is being targeted is the weathervane scallop, which is the largest of ten separate species found in the area.

Weathervane larvae drift in the water and seek a place to attach themselves. Spat are collected by suspending onion bags full of monofilament line from anchored and buoyed lines near known scallop beds. The larvae attach themselves to the monofilament in the bags until they become mature enough to drop off and continue their life cycle on the bottom. By this time they are too big to fit through the onion bag mesh and are captured. To date, many other kinds of shellfish have been collected but weathervane have proven elusive. A large-scale effort is planned for this summer.

In the initial grow-out phase, small scallops are placed in pearl nets to filter feed from the water as it is moved by tides and currents through the mesh of the net. Scallop culture is fairly labor intensive. Periodically the scallops must be removed to be cleaned, checked and sorted. After approximately one year, the scallops

are moved to final grow-out nets of larger mesh or alternatively strung on lines through holes drilled in their shells. Within two to three years the scallops reach harvester size of about five inches in diameter. Maricultured scallops are generally sold on the gourmet half-shell market.

If current larvae collection efforts are successful and a reliable source of spat is developed either through wild capture or hatchery techniques, scallop mariculture could become a viable industry, suitable to many of the coastal areas of Alaska. Based on the experience of the Japanese industry, there could be potential for cultivating scallops in Alaska.

Giant Kelp

Herring roe-on-kelp is the highest priced fisheries product harvested in Alaska. Roe-on-kelp is known as kazunoko kombu in Japan where it is a traditional delicacy. The Japanese market is expected to provide the impetus for development of a sea vegetable industry involving the cultivation of giant kelp in Alaska. The roe-on-kelp pound fishery, which would serve as the basis for giant kelp mariculture, occurs in Prince William Sound for a few days each spring. In 1987, herring roe-on-kelp sold for $10 - $14/lb. (depending on the grade of product) and the pound fishery grossed approximately $1.2 million on a harvest of 60.26 tons.

In the pound fishery, giant kelp is harvested in Southeast (where it grows wild) and is transported to Prince William Sound (where it is not native). The kelp is suspended in net-enclosed rafts or pounds. Ripe schools of herring are caught by fishing vessels in seine nets and transferred to the pound, where they are held until spawning occurs on the enclosed kelp. The roe-laden kelp is then harvested at the optimum time for the highest quality roe and the herring are released to return and spawn again in future years.

In the traditional sac roe fisheries, the spawning herring are caught in nets, frozen in blocks and generally shipped to Japan to be stripped of their roe. Because the adult herring are not killed and a much higher valued product is produced, the pound fishery is an attractive alternative to the traditional sac roe fisheries.

A major concern in the management of the existing roe-on-kelp fishery is the potential for overharvesting the wild giant kelp resource. One way to avoid this would be to artificially cultivate kelp on farms to enhance existing beds. Sheldon Jackson College in Sitka is conducting an experimental project to test the feasibility of kelp mariculture in Southeast under the same Alaska-Japan cooperation agreement as the scallop project in Kodiak. A smaller kelp project will also be conducted in Kodiak over the next year.

Giant kelp is cultivated by collecting sporofites from wild plants. At the appropriate stage of development, juvenile plants are started on strings, which are then threaded through a groundline that is suspended just off the seabed. When the plants reach maturity, the groundline is retrieved and the kelp fronds are harvested.

Herring roe-on-kelp is the highest priced fisheries product harvested in Alaska.

In recent years the pound fishery has become so popular that the Board of Fisheries limited entry to the pound fishery at 125 permits in February of this year. The 1987 fishery quota was set at 85 tons. The Board of Fisheries has been petitioned by many groups wishing to start pounding operations in other areas of the state, but has turned them down because available roe herring stocks are being fully exploited by traditional net fisheries.

The Department of Fish and Game is in the process of surveying widely scattered herring stocks to see if there are any which are currently unexploited by existing sac roe fisheries that could support further pound fisheries. Thus it appears that while kelp farmers could have a good roe-on-kelp fishery market, the ultimate feasibility of giant kelp mariculture will probably depend on locating an adequate roe herring resource.

Conclusion

Aquaculture diversification is proceeding along several paths in Alaska and holds great promise for the economies of coastal communities. Two recent developments have conspired to make the articulation of a State policy for mariculture development take on a sense of urgency. First the Attorney General's Office has issued an opinion that says that salmon farming is legal under existing statutes. Second, a lawsuit has been filed against the State by Wilderness Acquisitions, Inc. for denial of the permits necessary to start a hatchery and salmon farm at Warm Springs Bay on Baranof Island. If the State loses this case in court, it could open the way for further litigation and potentially allow salmon farming under very loose regulatory guidelines.

In response to these developments, the legislature has passed a bill (Chapter 70, SLA 1987) that places a one-year moratorium on the issuance of licenses, permits, leases or authorizations for commercial finfish farming but allows the experimental scallop and giant kelp projects to proceed. Oyster and mussel farmers will continue to operate under the current permit situation until an agreeable regulatory structure can be worked out. This legislation is designed to allow an interim committee of representatives of the various regulatory agencies and interest groups to design a comprehensive policy for further mariculture development.

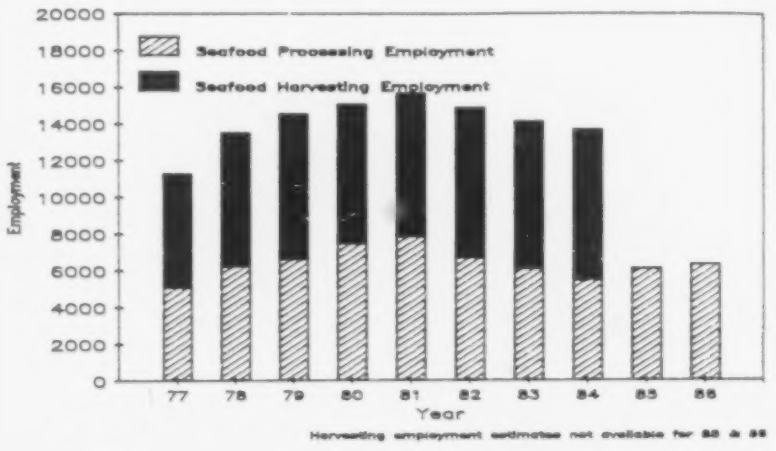
All parties concerned feel that aquaculture diversification is too important to proceed haphazardly and should be undertaken within a policy framework that is clearly laid out in State law.

Employment in Alaska's Seafood Industry

By Neal Fried and John Boucher

The seafood industry has been a major contributor to Alaska's overall economy since the late 1800s. Commercial fish canning began in 1878 in Southeast Alaska and the number of canneries in Alaska increased steadily for the next fifty years. The number of canneries reached their peak in 1929 at 160. Although the number of canneries has declined since, the seafood industry remains an important economic activity in Alaska. Canneries and fishing fleets provide economic activity around which coastal communities from Ketchikan to Kotzebue sprang up and prospered.

Figure 1
Seafood Industry Employment 1977-1986



In recent years oil has been such a dominant force in Alaska's economy that strong growth in Alaska's seafood industry has gone unnoticed. Now, with lower oil prices and reduced state government spending, Alaska's seafood industry is reemerging as a leader in employment and industry growth. Today, employment is more than double the levels of the 1960s and early 1970s. The development of new seafood products, the recovery in the salmon fishery, and expanding shellfish and bottomfish harvests have made this growth possible.

This article examines employment and trends in the seafood industry. Seafood industry employment is broken into two components; seafood harvesters (fishermen) and seafood processors (manufacturing). This method is used for several reasons.

First seafood processing and harvesting employment estimates are obtained by separate methodologies. Seafood processing employment is covered by unemployment insurance and therefore included in the nonagricultural wage and salary employment figures published monthly. Seafood harvesting employment is not covered by unemployment insurance, unless the number of the crew is ten or more and they receive a wage or salary.

Since most crew members work for a share of the catch they are considered self-employed and not included in the nonagricultural employment numbers. Data from the Commercial Fisheries Entry Commission and crew factors for various types of fisheries are used to estimate seafood harvesting employment. (For an explanation of methodology see *Alaska Seafood Industry Employment*, Alaska Department of Labor, June 1987)

In addition to methodological considerations, seafood processing and harvesting are different occupations. Seafood harvesting attracts independent individuals who are willing to take high risks for potential big gains. Processing work on the other hand is manufacturing factory work at relatively low pay. The levels of employment are related, however, and estimates of seafood processing employment give an indication of the level and trend of seafood harvesting employment (Figure 1 and Table 1).

Seafood Harvesting Employment

Since seafood harvesting employment is classified as self-employed and not collected by an ongoing survey such as that used to collect nonagricultural wage and salary employment an alternative method to estimate seafood harvesting employment was developed. This data was first estimated for 1977 through 1981 and was recently updated through 1984. (See *Alaska Seafood Industry Employment*, Alaska Department of Labor, June, 1987.)

From 1977 to 1984 the number of seafood harvesters in Alaska increased by one-third, with most of the increase occurring prior to 1980. In 1977, annual average employment in all fisheries was 6,164. By 1979, seafood harvesting employment was 7,919 and it has remained around 8,000 since. In 1984, seafood harvesting employment recorded its highest level of employment since 1977 with an annual average employment of 8,202.

Seafood Processing Employment

The seafood processing component is the other major employment generator in Alaska's seafood industry and is Alaska's leading manufacturer. Over the past decade annual average seafood processing employment has been relatively stable. The low point was 5,463 annual average employment in 1977. At that time salmon harvests were just beginning to recover after a number of lean years. Employment in the industry peaked in 1981 when a very healthy salmon season pushed annual average employment in seafood processing to 7,957, a record. Ironically, this was also the year the collapse of the king crab fishery began.

No other industry in the state is as seasonal as the seafood industry. In 1986 seafood processing employment peaked at 15,007 in July; with an annual average 6,813 jobs. This represents 41-45% of the jobs in the seafood industry and 3% of the states total wage and salary employment. During the past three years the peak month's employment in seafood processing is seven times the low month's employment. The peak month traditionally occurs during the salmon harvest in July or August and the low point is in January. (Figure 2)

Table 1
Seafood Industry Employment by Major Category
1977-1984 Annual Averages

Year	Seafood Processing	Seafood Harvesting	Total Seafood Industry
1977	5,122	6,164	11,286
1978	6,274	7,278	13,352
1979	6,657	7,919	14,576
1980	7,510	7,590	15,100
1981	7,884	7,821	15,705
1982	6,730	8,194	14,924
1983	6,132	8,029	14,161
1984	5,521	8,202	13,723
1985	6,149	*	
1986	6,366	*	

* Estimate not available

Trends in the Seafood Industry

Through 1984, three fisheries were responsible for most of the growth in seafood employment: the salmon fishery, the halibut fishery and the herring fishery. Of the 2,000 seafood harvesters added from 1977 to 1984, over half were in the salmon fishery, 400 in the halibut fishery, and 300 in the herring fishery. The bottomfish and sablefish fisheries account for most of the balance of seafood harvesting employment growth since 1977.

Seafood harvesting employment and other available data show that salmon is the most important species for Alaska seafood harvesters (Figure 3). In 1984 the salmon fishery provided 65% of all seafood harvesting employment. After salmon, the nearest fishery was shellfish which accounted for 14% of the total employment. Halibut was third at 11%.

Since 1977, the mix of employment by species has changed because of the collapse in the shellfish fishery. In 1977, the shellfish fishery accounted for 18% of all seafood harvesting employment and it maintained that level through 1983. By 1984, harvesting employment in the shellfish fishery dropped off dramatically because of disappearing shellfish stocks. From 1977-1980 the annual shellfish catch

Figure 2
Seasonality of Fishing Industry Employment 1984

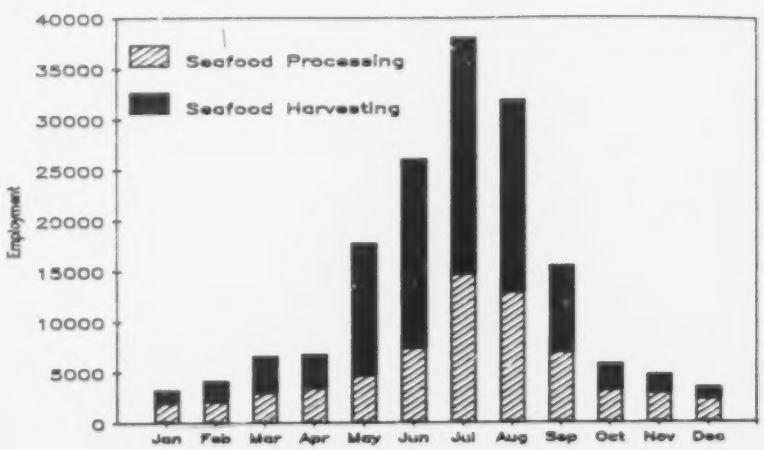


Figure 3
Seafood Harvesting Employment by Species
1984 Annual Average

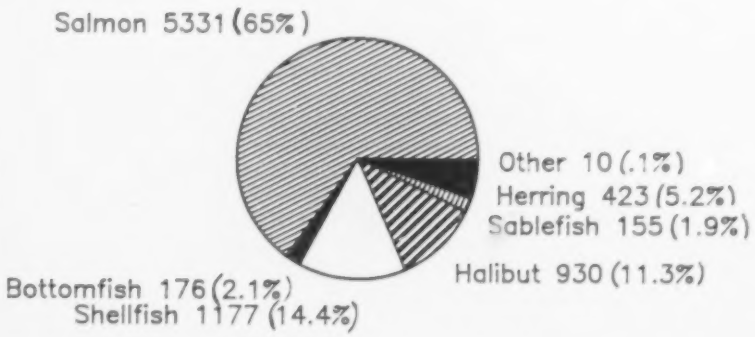
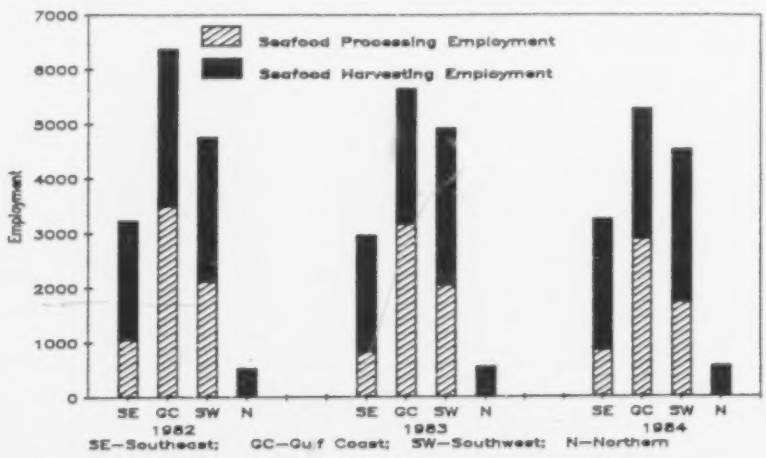


Figure 4
Fishing Employment by Region 1982-1984



was over 300 million pounds, but by 1984 the shellfish catch was down to 91 million pounds, little more than one-quarter of the total harvested in the late 1970s.

In contrast to the decline in employment in the shellfish fishery, the halibut fishery has seen its share of total harvesting employment steadily increase since 1977. In 1978 the halibut fishery accounted for 7% of total seafood harvesting employment. By 1984 it had climbed to 11% of the total seafood harvesting employment.

Unlike Alaska's economy as a whole, seasonality has increased in the seafood processing industry over the past decade. During the late 1970s and early 1980s the difference between high and low months was three-fold unlike the seven-fold it has been during the past three years. Seasonality of the industry has increased because: 1) the collapse of the king crab fishery which provided significant employment during the non-salmon season, 2) other shellfish harvests such as shrimp and tanner crab suffered declines, 3) the volume of salmon processed increased, and 4) certain fishing seasons, such as halibut and herring were shortened so that an increasingly concentrated effort during a shorter period of time now takes place, causing more dramatic swings in employment.

In the future there could be some smoothing out in the seasonality if the bottomfish fishery continues to grow. Fishing activity in bottomfishing is not limited to three or four months out of the year, but instead is a year-round activity. This year a number of processors in Kodiak plan on operating both bottomfish and salmon lines simultaneously for the first time. A return to a healthy shellfish fishery could also temper the fluctuations in employment. The less seasonal the industry becomes, the more Alaskan residents could depend on it as source of their livelihood.

Geographic Distribution

Not surprisingly, seafood industry employment is concentrated in Alaska's coastal communities and is an important contributor to employment in all the coastal regions of Alaska (Figure 4). In rural areas seafood harvesting's stature as a source of employment is greater than urban areas where local economies are not as dependent upon this single resource. In 1985, 95% of the seafood processing employment was concentrated in three regions—the Gulf Coast (including Anchorage/MatSu) (48%), Southwest (32%) and in Southeast (16%). Interior Alaska is the only region where there is no significant seafood employment.1/

Southwest Alaska has the largest amount of seafood harvesters and its economy relies more heavily on harvesting employment than any other region in Alaska. On an annual average basis, seafood harvesting employment in the Southwest region was

1/ Because of the way harvesting data is aggregated, Anchorage/MatSu is included with the Gulf Coast Region's data. Seafood harvesting employment is not available separately for the Anchorage/MatSu Region. In addition the processing data for the Southwest Region falls in areas that are included in the Northern Region for fish harvesting.

nearly 2,800 in 1984. If seafood harvesting employment were compared to nonagricultural wage and salary employment, seafood harvesting would be the largest employer except local government. If seafood harvesting and seafood processing employment are added together they surpass local government's total annual employment. In June, July, and August, seafood harvesting and seafood processing employment combine to create over 10,000 jobs in the region. A recent report by the University of Alaska's Institute of Social and Economic Research (ISER) on the commercial seafood industry in Alaska estimated that the fisheries industry generated 47% of all income earned in the Southwest region. If just private sector basic industry income is considered, fishing generated 98% of all private sector basic industry income in Southwest Alaska.

The Gulf Coast and Southeast regions of Alaska are not as dependent upon seafood harvesting employment as Southwest Alaska, but seafood harvesters do play a significant role in their economies. Processors in the Gulf Coast and Southeast often benefit from fish harvested in other region's waters. The Southwest region produced the largest harvests—almost twice as large as the Gulf Coast's but its processing employment is significantly smaller. It is not unusual for a share of the large Bristol Bay salmon catch to be processed in the Gulf Coast.

In 1984, seafood harvesting employment in the Gulf Coast and Southeast Alaska was comparable, slightly under 2,400 in both regions. Although Southeast Alaska had slightly more harvesting employment in 1984 than the Gulf Coast, historically the Gulf Coast has had more seafood harvesting employment. The flip-flop is due to the collapse in the Gulf Coast's crab fishery. The Gulf Coast region has historically relied on the shellfish fishery for about 25% of its total harvesting employment. On the other hand, Southeast Alaska's shellfish fisheries share of total employment only recently topped 10% of total harvesting employment.

Gulf Coast seafood processing is dominated by Kodiak and Cook Inlet processors. Kodiak is Alaska's number one fish port for value of fish landed and second only to New Bedford, Maine nationwide. Kodiak presently has 13 active fish processors, the largest number in any one community in the state. The Southwest region is dominated by Dutch Harbor and Bristol Bay processors.

The Northern region's seafood harvesting employment is rather small when compared to the other regions. The fishing industry's importance is minimal when compared to the oil industry, but it does provide employment and income primarily to the northwest coastal communities of the state.

Floating Processors Increase in Number

One change occuring in the processing arena is an increase in the number of floating fish processors. Floating processors provide flexibility by moving with ease from one fishery to the next. According to the Alaska Department of Environmental Conservation's records there are approximately 3-times as many floating processors permitted in 1987 than there were in 1980.

There is some concern regarding this trend because many floating processors are based out-of-state, and therefore may more readily buy their supplies and bring in their crews from elsewhere. This would mean little economic activity generated in Alaska's economy, and would make the goal to improve resident hire much more difficult. The growth in the number of floating processors does not necessarily mean Alaska will accrue less economic benefit from floating processors than shore based operations. It will depend on whether these floating processors dock in Alaska's ports for repairs, supplies and workers.

Product Changes

The biggest change occurring presently is the growing bottomfishery in Alaska. Though we are unable to accurately break down seafood processing employment by species we know this fishery has made measurable inroads into Alaska's processing industry. The bottomfish harvest has increased dramatically for domestic fisherman. The areas most active in bottomfish processing have been Kodiak and Dutch Harbor. During the past year, processors in Kodiak and in Dutch Harbor have processed bottomfish for filets, surimi, and blocks.

Some Cook Inlet processors and others in the state also began to process bottomfish during the past two years, and others are considering expanding to process bottomfish. The potential is great, and if Alaskan based processors succeed in capturing a large portion of the harvest, it could provide the biggest boost to the seafood industry since the growth in the King Crab harvests of the late 1970s and early 1980s. An additional benefit of a growing bottomfishery is the smoothing of the seasonality of this industry.

An increasing amount of salmon are being processed for the fresh/frozen market as opposed to canning. In 1977 32% of the salmon processed were fresh or frozen while 64% were canned. By 1985 the proportions had reversed themselves; 66% were processed for the fresh/frozen market and 32% were canned. These proportions fluctuate each year but with a trend towards a greater percentage of fresh and frozen salmon. For example in 1982, the year after the botulism scare, 70% of the salmon were fresh/frozen. The effects a shift to a fresh/frozen product has had on processing employment is not clear. Some claim it utilizes more labor and other say less.

In addition to a growing fresh/frozen product, Hormel, Bumble Bee and others are introducing a new method to can skinless and boneless pink salmon. The project is an attempt to broaden the appeal of canned pink salmon. If it proves to be successful it could help insure a permanent market for Alaska's largest salmon fishery.

Employment of Residents

Few residents work in Alaska's seafood processing plants. As a low paying and uncertain source of employment it is difficult to sustain a person in areas with a high cost of living.

In 1985, 69% of all seafood processing workers were nonresidents. The migration of thousands of college

students and others from the lower 48 is an annual ritual. They are Alaska's 'migrant' workers. A majority come for three to four months during the summer season and then leave. Some begin with the herring fishery in Togiak in April and work their way down the coast to Ketchikan in September to process salmon. The seasonality of the fishery partially explains why so few residents choose to work in this industry.

Wages paid in this industry make work less attractive to residents. The average entry hourly wage is $5.66 per hour and the average hourly wage for a person with a two years of experience is $6.67. Long working hours can boost earnings, but in spite of this, the average monthly wage in this industry remains low. In 1985 the average monthly earnings was $1,443 in seafood processing, only 61% of the monthly average of $2,369 for all industries. The highest wages are paid during the salmon season because of longer hours worked. The average monthly earnings climb to $1,600 during the third quarter of the year.

Over time, seafood processing earnings have increased little, and if they are adjusted for inflation they have actually lost purchasing power. The average monthly earnings would have fallen further if salmon's relative importance hadn't increased over the past six years because of the poor shellfish fishery. The combination of low wages, seasonality, a long tradition for many fish processors to hire their crews outside of Alaska, and possibly working conditions have all tended to make the percentage of nonresidents high in this industry.

In the future the number of residents represented in the processing industry could grow for two reasons. Presently there are far fewer employment opportunities in the state than in past years and therefore more state residents may choose to work in this industry. Also, the Department of Labor and a group of fish processors are making greater efforts to facilitate and encourage state residents to work in this industry.

Resource Management and Seafood Harvesting Employment

Any discussion of seafood harvesting employment must acknowledge the enormous effect that resource managers have on seafood harvesting employment. Since so few variables affecting the availability of the fisheries resource can be controlled, resource managers control the number of fishermen, the type of gear used, and the time that fishing can take place. In short, resource managers can be one of the most important variables in the amount of seafood harvesting employment.

Alaska's salmon fishery is an example of how resource managers have affected salmon harvesting employment. Since 1975, Alaska's salmon fishery has been managed through limited entry. Permits are issued that limit the number of seafood harvesters that have access to the fishery. The result has been that except for a jump in salmon harvesting employment that occurred from 1977 to 1978, salmon harvesting employment has remained stable at around 5,000 harvesters.

Limited entry is not the only way that resource managers can affect harvesting employment in a fishery. Halibut harvesting employment has been made more seasonal since 1977 because the halibut fishery is not limited. Since fishermen are allowed free access to the fishing grounds, the length of halibut openings have been dramatically shortened. In 1977 the halibut season lasted five months and monthly employment never exceeded 1,800. By 1984 halibut was a one month fishery with employment during that month of over 9,000.

Resource managers do not always act as a limiting factor to seafood harvesting employment. In the case of the bottomfish industry, Congress mandated with the Magnuson Act of 1980 that resource managers act to expand seafood harvesting employment by "Americanizing" the bottomfish industry. The growth of bottomfish harvesting employment, at least through 1984, has been slow but it has been accelerating. From 1983 to 1984, the total number of employees involved in bottomfish grew 47% compared to the usual 20 to 25% growth. Bottomfish harvesting employment has grown 450% from 1977 to 1984.

Projections of the American take of bottomfish for 1987 indicate that volume processed will be double the volume processed in 1984. In Japan, retraining programs are being instituted for Japanese bottomfishermen who have been laid off due to Americanization of the industry. All of these point to increasing bottomfish harvesting employment for the immediate future.

Another way resource managers affect seafood harvesting employment is by increasing the available supply of fish through hatchery programs. By enhancing the supply of salmon through state owned and private nonprofit hatcheries, the salmon fishery has increase from 304 million pounds harvested in 1977 to 650 million pounds in 1984.

Conclusion

The seafood industry provides many benefits to Alaska's economy including direct jobs. In 1985 the value of Alaska's fish harvest was $565 million but the wholesale value to the processors was $1.1 billion. The processing of the fish provides an "added value" to the fish product. In other words the fish becomes a more valuable product after it is processed and some of the "added value" accrues to the state's economy in the form of direct jobs, taxes, and indirect jobs in the transportation and services industries. In 1986 $115 million was paid out in wages. Processors purchase supplies and other services and pay taxes in the communities they are located. And last but not least they provide the necessary infrastructure to operate one of Alaska's largest industries—fishing.

Working in the Fishing Industry

By James Wilson

Natural resources are the backbone of Alaska's economy. Furs, gold, oil, timber, and fish have all been important in the development of the state. The fishing industry is one of Alaska's largest employers with over 40,000 people participating in the harvesting and processing of fisheries stocks during the course of a year.

The fishing industry is highly seasonal with intense activity during a limited period of time. The last year for which estimates of fish harvesting employment were produced was 1984 (Table 1). At the peak of the salmon season over 21,000 people were working on fishing boats. Peak employment for shellfish harvesting was nearly 2,300, while over 8,600 people worked the halibut season during May.

Work on fishing vessels is typified by long hours, physically demanding work, and crowded living conditions while earnings of workers may be low.

The highest levels of employment in seafood processing occur during the summer months corresponding with the salmon runs (Table 2). During 1986, seafood processing employment peaked at approximately 15,000 during July. Because of the seasonal nature of the work the industry depends heavily on migrant workers to harvest and process fish.

Table 1
1984 Fish Harvesting Employment
by Commercial Fishery

	Salmon	Shell Fish	Halibut	Bottom Fish	Sable Fish	Herring	Other
Annual Average	5,331	1,177	930	176	155	423	10
January	122	861	0	198	35	44	3
February	248	1,582	0	181	47	0	4
March	429	2,272	0	245	63	584	26
April	543	1,102	0	306	182	1,149	23
May	719	614	8,689	216	139	2,603	13
June	16,043	961	483	110	407	643	3
July	21,834	973	244	91	281	20	3
August	16,681	860	1,169	79	230	4	0
September	6,233	1,215	563	97	396	6	4
October	815	1,583	8	129	37	10	23
November	194	1,349	0	241	22	12	11
December	116	759	0	226	38	8	10

Description of Work

Work on fishing vessels is typified by long hours in all kinds of weather. Fishing trips can last from one day to several weeks. The work is physically demanding and long hours are often worked under adverse conditions. Living conditions can be crowded and the earnings of workers may be low. Pay for fish harvesters is usually on a share basis and depends upon the success of the venture. Fishing boat crew members are expected to provide their own boots and clothing. Crew members will try to work in more than one fishery to maximize their earnings.

For seafood processing workers the work is usually indoors under wet, cold, and noisy conditions. Warm clothing and good boots are recommended. Rain gear is sometimes required. Jobs often involve long shifts that require standing most of the time while reaching for and handling fish and shellfish. In some cases the employer provides room and board for their processing workers.

Table 2
1985 Fish Processing Employment
by Industry

	Total	Canning Curing	Fresh/Frozen Packaging
Annual Average	6,150	1,897	4,253
January	1,941	754	1,187
February	2,601	888	1,713
March	2,803	882	1,921
April	3,980	1,006	2,974
May	5,803	1,457	4,346
June	8,354	2,241	6,113
July	15,546	5,072	10,474
August	14,876	4,649	10,227
September	9,660	3,169	6,491
October	3,539	1,091	2,448
November	2,490	744	1,746
December	2,196	805	1,391

Table 3
Job Opportunities in Seafood Processing
Estimated future Employment Levels for
Select Occupations

Select Occupations	1986 Employment	1991 Employment	Annual Growth
Butchers & Meatcutters	302	304	0
Cannery Workers	6,286	7,580	259
Supervisors, Misc.	181	197	3
Graders & Sorters	181	217	7
Meat/Fish Cutters - Hand	764	920	31

Note: Employment Services Activity data cover July 1985 to June 1986.
Note: 1991 occupational employment is estimated based on current staffing patterns within the industry.

Table 4
Alaska Department of Labor Job Service
Job Orders and Average Wage Offered
for Cannery Workers
July 1985 to June 1986

Job Service Office	Number of Openings	Hourly Wage
Statewide	7,571	$5.60
Kenai	1,291	5.58
Ketchikan	1,062	5.59
Anchorage	704	5.12
Valdez	673	5.76
Homer	587	5.85
Seward	528	6.25
Kodiak	481	5.72
Petersburg	441	5.48
Sitka	367	5.95
Dillingham	184	5.31
Bethel	130	6.84
Juneau	89	5.63
Dutch Harbor	79	5.25
Glennallen	67	6.00

Table 5
Wage Rate Survey
Data for Cannery Workers
July 1986

		Statewide	S.W. Region	Gulf Region	S.E. Region
Non Union Wages:					
Entry Level	Average	$5.66	$5.59	$5.72	$5.62
	High	8.66	6.00	6.10	
	Low	4.30	5.40	4.50	
2 Yrs Exper	Average	$6.67	$6.20	$6.50	$7.95
	High	8.66	8.50	10.65	
	Low	4.55	5.50	6.50	
Union Wages:					
Journeyman level		$5.81	Regional data not available		

Job Openings

Employment estimates for fish harvesting (Table 1) show the number of people working during a season. How many of the jobs are available because of crew turnover or the expectation of a good harvest is a point of speculation. No data base exists to quantify this. For fish harvesting there appears to be a surplus of inexperienced people and a sufficient number of experienced crew members with skills to meet the needs of the industry.

On the other hand, Job Service data on seafood processing show fewer applicants than job orders. Employment growth is expected to occur with additional jobs being created. Many people who work in seafood processing are placed by the Alaska Department of Labor's Job Service offices. Roughly 7,000 job orders were received from employers during the period July 1985 to June 1986 (Table 3). For cannery workers the greatest number of job orders were in Kenai and Ketchikan (Table 4). Over 700 job orders for cannery workers were processed through the Anchorage office, our state's largest urban center.

Hiring Practices

For fishing boat crew members the hiring is done by individual boat owners. Success in finding a job depends upon the person and knowing when and who to approach. Often hires are accomplished by walking the docks and talking to individual skippers and other crew.

Boat owners prefer working with experienced hands, especially those they have signed on before. The most successful and experienced skippers have their choice of crew members. All persons working on a commercial fishing vessel are required to have a crew members license. The license is available through most vendors which issue sport fishing licenses. The fee for residents is $30.

Many of the companies operating seafood processing facilities in Alaska are based outside the state. Some of the hiring is done in their offices in Seattle prior to the start up of the season. As described above, the Alaska Employment Service processes many job orders for seafood processing wor-

kers and there is a shortage of in-state applicants for these jobs.

Wages

The usual arrangement in seafood harvesting is for crew members to share profits. Earnings will depend upon the size and type of the catch. An inexperienced crew member may receive a share as low as 6%, but most of the crew members receive shares ranging from 10% to 33%, depending upon their experience and the type of fishing being done. According to the Alaska Career Information System description for fish harvesting, over one-half of the fishing crew members earn less than $5,000 per season and only about 10% earn more than $20,000.

While boat crew members are paid on a percentage basis, seafood processing employees receive wages on an hourly basis. The statewide average entry level wage for cannery workers was $5.66 during July 1986. The average wage for workers with two years of experience was $6.67 an hour (Table 5). The wage rate for cannery workers varies depending upon the employer and location of the processing site (Table 6). Over $112 million was paid in total wages by the food processing industry during 1985.

Table 6
Alaska Department of Labor Job Service
Job Orders and Average Wage Offered
for Other Seafood Related Workers
July 1985 to June 1986

Job Service Office Occupation	Number of Openings	Hourly Wage
Dillingham		
Misc. Fishing	20	$11.63
Dutch Harbor		
Misc. Fishing	6	9.32
Homer		
Misc Fishing	10	7.42
Juneau		
Hand Packers	5	7.85
Ketchikan		
Hand Packers	5	6.10
Kotzebue		
Cutters & Trimmers	107	8.91
Misc. Fishing	3	12.65
Kodiak		
Cutting Machine Op	149	6.44
Hand Packers	30	6.15
Cutters & Trimmers	16	5.81
Misc. Fishing	21	6.53
Seward		
Cutting Machine Op	35	4.05
Testers/Graders/Sorter	15	5.85
Sitka		
Hand Packers	31	4.95
Valdez		
Testers/Graders/Sorter	18	4.50

Note: Job service offices and Occupations were selected for which the occupational classification would most directly be related and limited to seafood processing.

Risks of Working in the Fishing Industry

The food processing industry, predominately seafood processing, has one of the highest rates of worker injuries and illnesses in Alaska. The Occupational Safety and Health Administration recordable injuries and illnesses in food processing was 32.5 cases per 100 full time equivalent (FTE) workers in 1985. This is nearly three times the private sector rate of 12.6 cases per 100 FTE workers for injuries and illnesses.

The time loss rate for workdays lost due to injury or illness for the food processing industry was 123 days per 100 FTE workers versus the 81 days per 100 FTE workers in the overall private sector. Table 7 contains a summary of the number of cases for time loss injuries and illnesses by the type of injury.

Table 7
Injury Characteristics
for Time Loss Injuries and Illnesses
in the Seafood Processing Industry
1985

Number of Case By Nature of Injury	# of Cases	% of Total
Sprains and Strains	286	35.4
Contusions, Bruises	158	19.5
Cuts, Lacerations	94	11.6
Fracture	68	8.4
Other	203	25.1
Total	809	100.0

Over one-fourth of the total estimated work related illnesses in food processing in 1985 were skin diseases. Discussions with seafood processing employers indicate that dermatitis and contact allergy conditions are the most common occupational illness cases in the industry. As in other industries the leading cause of time loss injury are falls and overexertion, which result in back injuries.

Unlike seafood processing workers, fish harvesters are not covered under the Alaska Workers' Compensation Act. Information on work related injuries in the fishing industry is not included in traditional statistical sources. There is, however, one source of data which gives information on injuries incurred by fish harvesters, the Alaska Fishermen's Fund.

The Alaska Fishermen's Fund was established in 1951 to provide for treatment and care of Alaska's licensed commercial fishermen who are in-

jured or become ill due to commercial fishing in Alaska. The total maximum allowance for any one injury or disablement cannot exceed $2,500. No payments are made on expenses incurred over one year after the date of initial allowance.

Money to support the fund comes from 60% of each commercial fishermen's license fee. To be eligible for coverage, the injury or illness must directly relate to commercial fishing activities and the injury or illness must have occurred in Alaska or in Alaskan waters. Covered expenses include medical and hospitalization costs, pharmaceuticals, and some transportation costs. There is no death benefit for survivors of fishermen who die while fishing in Alaska.

Up to 25,000 people participate in fish harvesting during a year in Alaska with annual average employment of around 8,000. During state fiscal year 1986, the Fishermen's Fund office received 3,011 claims. Approximately one-third of the claims were filed by nonresident fishermen. During fiscal year 1986 the average benefit paid was $362.29.

The available injury characteristic information from the Fishermen's Fund shows that 32% of fish harvester injuries are sprains. This is a lower ratio than the average for all other industries. The second leading injury for fish harvesters was "cuts, lacerations, abrasions, and punctures" which accounting for 19% of the total.

Conclusion

The seafood industry offers job opportunities for the unskilled worker although the work is seasonal, low paying, and difficult. For individuals interested in job opportunities in seafood processing the place to start looking is the Alaska Department of Labor's Job Service offices. A joint effort between the processors and the Job Service offices has been underway to place as many Alaska residents as possible in seafood processing jobs. To find a job in the seafood harvesting end of the business is more difficult. Personal contacts and an individual effort offer the best chance to land a position as a crew member of a fishing boat.

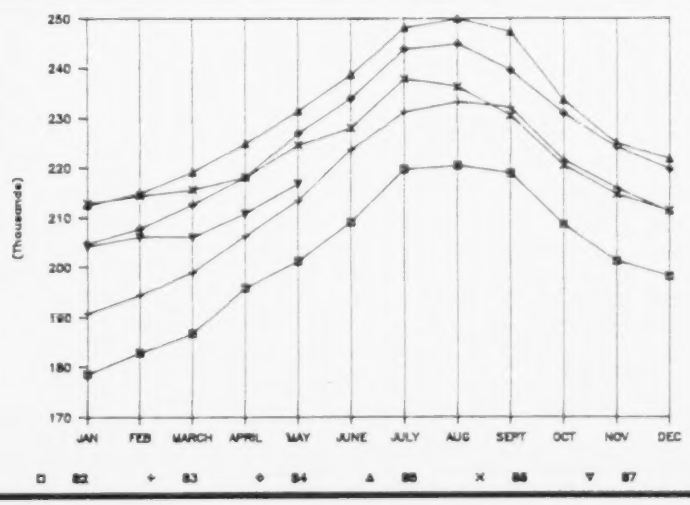
Alaska's Employment Scene

By Greg Huff

Although Alaska's economy continues to suffer from the 1986 collapse of world oil prices, employment opportunities increased in May as fishing, tourism, and other seasonal industries began their summer recovery. Nonagricultural wage and salary employment increased 6,000 jobs in May from April (Table 1) but was well below May 1985.

The largest increase in employment was in manufacturing; with 1,800 of the 2,000 increase in manufacturing jobs occurring in the seafood processing sector as the fishing industry began to gear up for another summer season. With the increased activity, the average hourly and average weekly earnings fell as the number of lower paid summer jobs increased in the industry (Table 8).

Figure 1
Alaska Employment 1982-1987



Additional gains in manufacturing employment were predominately in the lumber and paper products sector. Average weekly hours in the lumber and paper products industry increased over-the-month as the logging crews worked more hours with the longer summer days. The average hours worked per week increased from 47.3 to 52.7 with average weekly earnings increasing proportionately.

Signs that Alaska's tourist season was getting underway were the Substantial increases in air and ground passenger transportation employment, hotel/motel employment, and retail trade jobs, particularly eating and drinking establishments. The addition of temporary part-time help is revealed in the hours and earnings data for the trade and transportation

industries, as the average hours worked per week in those industries declined.

Employment in construction expanded by 1,500 in May and appears to be responsible for much of the four-tenths of a percentage point drop in the statewide unemployment rate from April's 11.5% rate to 11.1% in May. The number of weeks claimed by former construction workers fell almost 25% in May compared to April according to unemployment insurance weeks claimed data. Although more construction workers went to work in May, the average hours worked did not change significantly from April.

Year-to-Year Comparison of Employment

Aside from seasonal increases in employment the Alaska economy does not present a wide variety of opportunities for the job seeker. Employment levels were depressed in nearly all industries from the previous year. Total employment is down 3.4% or 7,700 jobs below May 1986. When comparing 1987's employment to previous years (Figure 1) employment, 1987 was not only below 1986 levels but below the levels of May 1984.

The poor performance of Alaska's economy in 1987 is primarily a result of last year's collapse of world crude oil prices. Although Alaska's economy was likely to have a mild recession in 1986 the rapid and severe decline in oil prices from February through July of 1986 turned a mild downturn into the worst economic recession in Alaska's 27 years of statehood. The shock rippled through the economy, first hitting the oil and gas industry and exacerbating the ills of an already weak construction sector. The support sectors to these industries were next to feel the pinch and by mid-1986 government employment began to decline.

By May 1987 construction and mining industry employment losses had moderated (Figure 2), while job losses in state and local government and the secondary industries (those industries providing goods and services such as retail trade or banking) have gained momentum and supplied most of the employment declines over the year.

Table 1
Nonagricultural Wage and Salary Employment
By Place of Work
Alaska

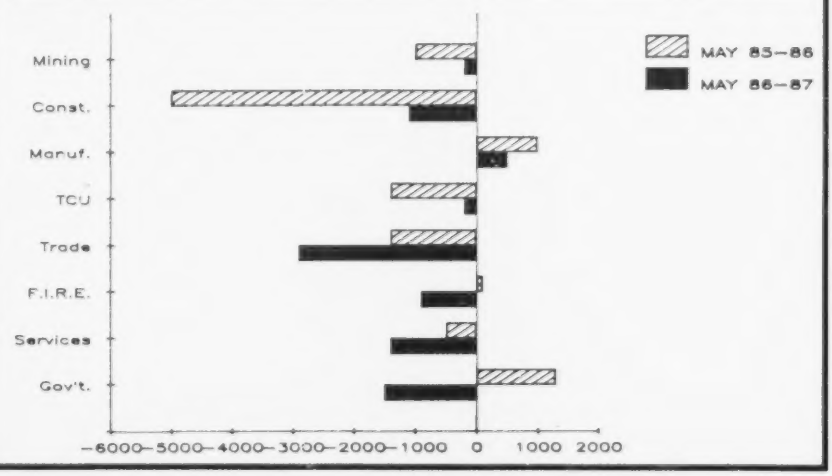
	p/ 5/87	r/ 4/87	5/86	Changes From: 4/87	5/36
Nonag. Wage & Salary	216,900	210,900	224,600	6,000	-7,700
Mining	8,300	8,400	8,500	-100	-200
Construction	11,900	10,400	13,000	1,500	-1,100
Manufacturing	13,600	11,600	13,100	2,000	500
Food & Kindred Prod.	7,500	5,700	7,100	1,800	400
Lumber & Paper Prod.	3,000	2,900	2,800	100	200
All Other Mfg.	3,100	3,000	3,200	100	-100
Trans. Comm. & Utilities	18,000	17,200	18,200	800	-200
Trucking & Whseing.	2,000	1,900	2,400	100	-400
Water Transportation	1,100	1,000	1,200	100	-100
Air Transportation	5,600	5,400	5,400	200	200
Other Trans. Comm. & Utilities	9,300	8,900	9,200	400	100
Trade	41,800	40,800	44,700	1,000	-2,900
Wholesale	7,500	7,400	8,300	100	-800
Retail	34,300	33,400	36,400	900	-2,100
Gen. Mer. & Apparel	5,000	4,800	5,100	200	100
Food Stores	5,900	5,900	5,900	0	0
Eating & Drinking Pl.	12,900	12,300	13,700	600	-800
Other Retail Trade	10,500	10,400	11,700	100	-1,200
Finance-Ins. & R.E.	11,900	12,100	12,800	-200	-900
Services & Misc.	42,700	42,100	44,100	600	-1,400
Government	68,700	68,300	70,200	400	-1,500
Federal	18,500	18,200	18,000	300	500
State	19,300	19,700	20,900	-400	-1,600
Local	30,900	30,400	31,300	500	-400

Prepared in cooperation with the U.S. Bureau of Labor Statistics.
Government includes teachers in primary and secondary schools, and personnel employed by the University of Alaska.

Benchmark Date March 1986.

p/ Denotes Preliminary Estimates.
r/ Denotes Revised Estimates.

Figure 2
Employment Loss by Industry
May 1985 to May 1986 and May 1986 to May 1987



With world oil prices nearing $20 a barrel the downward momentum appears to have abated and confidence in the economy appears to have improved (according to recent business attitude surveys by Price Waterhouse and the Anchorage Chamber of Commerce). The downward momentum may begin again depending upon the degree of layoffs in state and local government and overall levels of state spending. Late summer employment statistics (early fall for school data) will reveal the extent of layoffs and the impact of less government spending.

Table 2
Nonagricultural Wage and Salary Employment
By Place of Work
Anchorage

	p/ 5/87	r/ 4/87	5/86	Changes From: 4/87	5/86
Nonag. Wage & Salary	104,550	102,800	109,900	1,750	-5,350
Mining	3,350	3,300	3,550	50	-200
Construction	6,650	5,900	7,150	750	-500
Manufacturing	2,550	2,350	2,600	200	-50
Food & Kindred Prod.	700	550	750	150	-50
Other Mfg.	1,850	1,800	1,850	50	0
Trans. Comm. & Utilities	9,150	8,950	9,500	200	-350
Trucking & Whseing.	1,350	1,350	1,500	0	-150
Water Transportation	300	250	350	50	-50
Air Transportation	3,000	2,950	2,950	50	50
Other Trans. Comm. & Utilities	4,500	4,400	4,700	100	-200
Trade	24,400	24,250	26,300	150	-1,900
Wholesale	5,500	5,500	6,250	0	-750
Retail	18,900	18,750	20,050	150	-1,150
Gen. Merchandise	1,800	1,750	1,800	50	0
Food Stores	3,000	2,950	2,900	50	100
Eating & Drinking Pl.	7,450	7,550	8,050	-100	-600
Other Retail Trade	6,650	6,500	7,300	150	-650
Finance-Ins. & R.E.	7,800	7,850	8,450	-50	-650
Services & Misc.	23,900	23,750	25,300	150	-1,400
Government	26,750	26,450	27,050	300	-300
Federal	10,450	10,300	10,000	150	450
State	6,950	7,150	7,500	-200	-550
Local	9,350	9,000	9,550	350	-200

Table 3
Nonagricultural Wage and Salary Employment
By Place of Work
Anchorage-MatSu

	p/ 5/87	r/ 4/87	5/86	Changes From: 4/87	5/86
Nonag. Wage & Salary	111,400	109,300	116,750	2,100	-5,350
Mining	3,350	3,300	3,550	50	-200
Construction	7,050	6,200	7,550	850	-500
Manufacturing	2,600	2,400	2,650	200	-50
Trans. Comm. & Utilities	10,000	9,650	10,150	350	-150
Trade	26,000	25,800	27,850	200	-1,850
Finance-Ins. & R.E.	8,350	8,350	8,950	0	-600
Services & Misc.	24,950	24,800	26,500	150	-1,550
Government	29,100	28,800	29,550	300	-450

What Can Pick Up the Slack

There have been many questions about the ability of other sectors to make up the jobs lost due to falling oil prices. There are no short term answers and oil will remain the primary ingredient causing employment levels to fluctuate up or down in the foreseeable future. This is evident when examining the primary sectors that drive the economy and create jobs by producing goods and services for export from Alaska.

Employment in Alaska can be attributed to a handful of primary sources. Besides petroleum, the primary sources include the federal government (both military and civilian), seafood harvesting and processing, timber, tourism and mineral mining. According to recent studies the federal government accounts for approximately 38% of all primary jobs in Alaska, petroleum accounts for 45% (oil industry and state revenues) and 17% stems from fishing, tourism and other basic industries, including non-petroleum mining./1

Currently the federal government employment and expenditures and the fishing industry have been growing moderately, the timber and paper industry has recovered and is experiencing employment gains, and mining activity is beginning to show signs of a turnaround, however, even with these positive influences in the economy the negative impacts of less oil and gas employment and expenditures and less state revenues outweigh these positive influences.

Geographic Breakdown

Every region of the state had an improvement in their unemployment rate, with the exception of the North-

1. *The Alaska Economy Where We Are and How We Got there*, Gunnar Knapp and Steve Colt, Institute of Social and Economic Research, ISER Working Paper 85.8, 1985.

ern Region (Table 9), although there was not always a corresponding improvement in the number of unemployed. An increase in the number of employed is largely responsible for the improved unemployment rate.

The Southeast Region had the lowest unemployment rate in May at 9.2% while the Interior Region had the highest rate at 15.0%. The Gulf Coast Region had the sharpest over-the-year drop, while the Northern Region had the greatest yearly increase in the unemployment rate. Although most regions experienced employment gains and lower unemployment rates in May compared to April the picture is varied in the year-ago comparisons.

Increases in seafood processing employment were the principal ingredients accounting for the unemployment rate to decline in the Gulf Coast and Southwest Regions. The growing number of seafood processing jobs improved the rate for the Gulf Coast Region, however, large declines in state and local government and construction employment are keeping the Gulf Coast economy in the doldrums.

In the Southeast Region a combination of gains in seafood processing and lumber and paper products contributed to a seasonal increase in employment and decline in the unemployment rate, however, losses in government offset many of the gains. State and local government declines are perhaps the most significant in the Southeast Region and Fairbanks because total government accounts for 35% of total employment in Fairbanks and 41% in the Southeast Region. In Fairbanks the trade and construction industries contributed to the seasonal increase in employment.

Declines in federal government employment in Southeast have added to the employment losses in state and local government whereas federal government has been a positive force for Fairbanks although positive impacts of the deployment of the light infantry division have just begun.

Anchorage experienced a modest increase in employment but the number of unemployed and the unemployment rate saw little improvement. In Anchorage the construction industry had the largest over-the-month increases in employment, although no industry had robust growth. A few industries, particularly eating and drinking places, that would normally increase in employment did not participate in the

Table 4
Nonagricultural Wage and Salary Employment
By Place of Work
Fairbanks

	p/ 5/87	r/ 4/87	5/86	Changes From: 4/87	5/86
Nonag. Wage & Salary	26,750	25,900	28,150	850	-1,400
Mining	100	100	100	0	0
Construction	1,400	1,100	1,650	300	-250
Manufacturing	600	600	600	0	0
Trans. Comm. & Utilities	2,700	2,500	2,700	200	0
Trucking & Whseing.	400	350	400	50	0
Air Transportation	950	950	950	0	0
Other Trans. Comm. & Utilities	1,350	1,200	1,350	150	0
Trade	5,800	5,350	6,150	450	-350
Wholesale	900	850	950	50	-50
Retail	4,900	4,500	5,200	400	-300
Gen. Mer. & Apparel	500	500	500	0	0
Food Stores	750	750	750	0	0
Other Retail Trade	3,650	3,250	3,950	400	-300
Finance-Ins. & R.E.	1,000	1,000	1,150	0	-150
Services & Misc.	5,700	5,650	5,850	50	-150
Government	9,450	9,600	9,950	-150	-500
Federal	3,000	2,950	2,950	50	50
State	3,700	3,950	4,000	-250	-300
Local	2,750	2,700	3,000	50	-250

Table 5
Nonagricultural Wage and Salary Employment
By Place of Work
Interior

	p/ 5/87	r/ 4/87	5/86	Changes From: 4/87	5/86
Nonag. Wage & Salary	31,100	29,850	32,500	1,250	-1,400
Mining	250	200	250	50	0
Construction	1,550	1,150	1,750	400	-200
Manufacturing	650	600	600	50	50
Trans. Comm. & Utilities	3,050	2,850	3,050	200	0
Trade	6,150	5,650	6,600	500	-450
Finance-Ins. & R.E.	1,100	1,100	1,200	0	-100
Services & Misc.	6,250	6,200	6,400	50	-150
Government	12,100	12,100	12,650	0	-550

Table 6
Nonagricultural Wage and Salary Employment
By Place of Work
Gulf Coast

	p/ 5/87	r/ 4/87	5/86	Changes From: 4/87	5/86
Nonag. Wage & Salary	20,200	19,050	20,500	1,150	-300
Mining	850	850	950	0	-100
Construction	1,000	850	1,200	150	-200
Manufacturing	3,850	3,100	3,550	750	300
Food & Kindred Prod.	3,250	2,500	2,950	750	300
All Other Mfg.	600	600	600	0	0
Trans. Comm. & Utilities	1,400	1,400	1,400	0	0
Trade	3,500	3,250	3,600	250	-100
Wholesale	600	500	600	100	0
Retail	2,900	2,750	3,000	150	-100
Finance-Ins. & R.E.	650	650	700	0	-50
Services & Misc.	3,450	3,350	3,350	100	100
Government	5,500	5,600	5,750	-100	-250
Federal	650	600	600	50	50
State	1,550	1,500	1,650	50	-100
Local	3,300	3,500	3,500	-200	-200

Table 7
Nonagricultural Wage and Salary Employment
By Place of Work
Southeast Alaska

	p/ 5/87	r/ 4/87	5/86	Changes From: 4/87	5/86
Nonag. Wage & Salary	28,400	27,650	29,800	750	-1,400
Construction	1,050	900	1,200	150	-150
Manufacturing	3,900	3,600	3,950	300	-50
Food & Kindred Prod.	950	800	1,100	150	-150
Lumber & Paper Prod.	2,750	2,600	2,650	150	100
All Other Mfg.	200	200	200	0	0
Trans. Comm. & Utilities	2,100	2,000	2,100	100	0
Trade	4,300	4,200	4,500	100	-200
Wholesale	350	350	300	0	50
Retail	3,950	3,850	4,200	100	-250
Finance-Ins. & R.E.	1,100	1,100	1,150	0	-50
Mining, Services & Misc.	4,400	4,300	4,550	100	-150
Government	11,550	11,550	12,350	0	-800
Federal	2,050	2,000	2,100	50	-50
State	5,200	5,200	5,700	0	-500
Local	4,300	4,350	4,550	-50	-250

Table 8
Alaska Hours and Earnings for Selected Industries 1/ 2/

	Average Weekly Earnings			Average Weekly Hours			Average Hourly Earnings		
	P/ 5/87	R/ 4/87	5/86	P/ 5/87	R/ 4/87	5/86	P/ 5/87	R/ 4/87	5/86
Mining	1,157.68	1,170.88	1,141.06	49.2	49.3	50.4	23.53	23.75	22.64
Construction	961.60	963.98	1,004.87	40.1	40.3	41.2	23.98	23.92	24.39
Manufacturing	499.40	506.32	479.97	44.0	42.8	40.3	11.35	11.83	11.91
Food & Kindred Prod	300.94	339.83	285.84	41.0	41.8	36.0	7.34	8.13	7.94
Lumber & Paper Prod	824.23	741.66	818.89	52.7	47.3	52.9	15.64	15.68	15.48
Trans. Comm. & Util.	539.55	539.96	552.09	34.9	35.5	35.3	15.46	15.21	15.64
Trade	375.02	399.24	376.53	34.0	35.3	33.0	11.03	11.31	11.41
Wholesale	514.94	565.11	492.51	38.4	39.0	36.7	13.41	14.49	13.42
Retail	327.28	342.38	334.12	32.5	34.0	31.7	10.07	10.07	10.54
Finance-Ins. & R.E	385.07	398.16	387.82	32.8	33.6	33.9	11.74	11.85	11.44

1/ Prepared in cooperation with the Bureau of Labor Statistics US Department of Labor

2/ excludes eating and drinking establishments

AVERAGE HOURS AND EARNINGS SERIES: Averages are based on data for full and part time production workers (manufacturing) and non-supervisory workers (nonmanufacturing) and are for gross earnings and hours paid, including overtime pay and hours.

seasonal upswing in employment. This is because local spending declined more than the early seasonal increase in tourist spending.

In Anchorage federal government employment increases have offset a number of losses in the local and state government sectors. The federal government increases in employment are a result of the arrival of AWACs and new F-15s at Elmendorf and increases in the Postal Service employment. Overall negative influences continue to outweigh the pluses in the Anchorage economy. Employment in the support sectors (like trade, finance, and services) fell rapidly in May accounting for the bulk of the employment losses.

The ailing oil industry was also the cause for the Northern regions unemployment rate to increase over last year's rate, as oil companies have reduced their exploration and development efforts because of low oil prices.

Conclusion

Although employment opportunities improved in May, it was in response to seasonal factors. Fishing, timber, construction, and tourism related industries all had an increase in employment over-the-month. While providing temporary relief, these increases should not be interpreted as a bottoming out of Alaska's current recession. Employment is down 3.4% from May 1986 and down 6.5% from May 1985. With anticipated cuts in state expenditures Alaska's employment will continue its decline by late summer.

The following notes pertain to Nonagricultural Wage and Salary Employment Tables:

Government includes teachers in primary and secondary schools, and personnel employed by the University of Alaska.

Benchmark date March 1986.

P/ Denotes preliminary estimates.
R/ Denotes revised estimates.

Table 9
Labor Force By Region and Census Area

	Labor Force			Unemployment			Rate			Employment		
	P/ 5/87	R/ 4/87	5/86	P/ 5/87	R/ 4/87	5/86	P/ 5/87	R/ 4/87	5/86	P/ 5/87	R/ 4/87	5/86
Alaska Statewide	258,108	253,429	263,007	28,570	29,031	28,880	11.1	11.5	11.0	229,538	224,398	234,127
Anch.-MatSu Region	136,615	134,778	140,007	13,569	13,725	13,937	9.9	10.2	10.0	123,046	121,053	126,070
Anchorage Borough	120,322	119,049	123,479	10,604	10,637	10,800	8.8	8.9	8.7	109,718	108,412	112,679
MatSu Borough	16,293	15,729	16,528	2,965	3,088	3,137	18.2	19.6	19.0	13,328	12,641	13,391
Gulf Coast Region	27,985	27,105	28,459	3,609	3,971	4,082	12.9	14.7	14.3	24,376	23,134	24,377
Kenai Peninsula Bor	17,320	16,908	17,737	2,776	3,105	3,192	16.0	18.4	18.0	14,544	13,803	14,545
Kodiak Island Bor	6,482	6,096	6,623	408	331	548	6.3	5.4	8.3	6,074	5,765	6,075
Valdez-Cordova	4,183	4,101	4,099	425	535	342	10.2	13.0	8.3	3,758	3,566	3,757
Interior Region	40,109	38,896	40,647	6,034	5,973	5,819	15.0	15.4	14.3	34,075	32,923	34,828
Fairbanks North Star Br	34,512	33,452	35,239	4,925	4,865	4,998	14.3	14.5	14.2	29,587	28,587	30,241
Southeast Fairbanks	2,372	2,318	2,377	385	399	347	16.2	17.2	14.6	1,987	1,919	2,030
Yukon-Koyukuk	3,225	3,126	3,031	724	709	474	22.4	22.7	15.6	2,501	2,417	2,557
Northern Region	7,999	8,049	7,834	1,097	946	923	13.7	11.8	11.8	6,902	7,103	6,911
Nome	3,115	3,133	3,090	493	435	465	15.8	13.9	15.0	2,622	2,698	2,625
North Slope Borough	2,745	2,769	2,696	205	155	153	7.5	5.6	5.7	2,540	2,614	2,543
Northwest Arctic Bor	2,139	2,147	2,048	399	356	305	18.7	16.6	14.9	1,740	1,791	1,743
Southeast Region	33,405	32,806	34,345	3,083	3,224	3,158	9.2	9.8	9.2	30,322	29,582	31,187
Haines Borough	922	904	936	103	105	94	11.2	11.6	10.0	819	799	842
Juneau Borough	14,488	14,172	15,052	1,049	1,062	1,229	7.2	7.5	8.2	13,439	13,110	13,823
Ketchikan Gateway Bor	6,771	6,651	6,977	663	692	695	9.8	10.4	10.0	6,108	5,959	6,282
Pr. of Wales-Outer Ktch	2,420	2,394	2,447	351	375	319	14.5	15.7	13.0	2,069	2,019	2,128
Sitka Borough	3,957	3,850	4,038	345	326	323	8.7	8.5	8.0	3,612	3,524	3,715
Skagway-Yakutat-Ang	1,490	1,505	1,561	193	239	227	13.0	15.9	14.5	1,297	1,266	1,334
Wrangell-Petersburg	3,357	3,330	3,334	379	425	271	11.3	12.8	8.1	2,978	2,905	3,063
Southwest Region	11,995	11,795	11,715	1,178	1,192	961	9.8	10.1	8.2	10,817	10,603	10,754
Aleutian Islands	3,020	2,965	2,964	131	133	92	4.3	4.5	3.1	2,889	2,832	2,872
Bethel	4,853	4,728	4,727	560	520	459	11.5	11.0	9.7	4,293	4,208	4,268
Bristol Bay Borough	444	450	439	32	46	29	7.2	10.2	6.6	412	404	410
Dillingham	2,146	2,121	2,051	233	246	149	10.9	11.6	7.3	1,913	1,875	1,902
Wade Hampton	1,532	1,531	1,534	222	247	232	14.5	16.1	15.1	1,310	1,284	1,302

P/ Preliminary R/ Revised 1986 Benchmark

Federal guidelines require the use of unrounded labor force data, adjusted to be consistent with the Current Population Survey (CPS) in formulas used to allocate federal funds. Comparisons between different time periods are not as meaningful as other time series published by the Alaska Department of Labor; because Alaska's CPS sample size is inadequate to accurately indicate monthly changes in level. The sampling errors are random in nature; meaning that the unemployment rates, in any given month, are as likely to be high as frequently as they are low. The official definitions of unemployment, currently in place, exclude anyone who has made no attempt to find work in the four week period up to and including the week that includes the twelfth of each month. Most economists feel that Alaska's rural localities have proportionately more of these discouraged workers.

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